

CLAIMS

What is claimed is:

- 1 1. A method of authenticating a network device, comprising the computer-implemented
2 steps of:
3 determining that a network link that uses a primary signaling technology and a
4 secondary signaling technology is coupled to the network device;
5 obtaining, using the secondary signaling technology, a unique link identifier that is
6 associated with the network link using the secondary signaling technology;
7 establishing the unique link identifier as a unique device identifier; and
8 authenticating the network device to a service provider by communicating the unique
9 device identifier to the service provider over the network link using the
10 primary signaling technology.
- 1 2. A method as recited in Claim 1, further comprising the steps of receiving a
2 configuration from the service provider over the network link using the primary signaling
3 technology.
- 1 3. A method as recited in Claim 1, wherein the secondary signaling technology is
2 integrated services digital network (ISDN) signaling.
- 1 4. A method as recited in Claim 1, wherein the secondary signaling technology is ISDN,
2 and wherein the unique link identifier is a telephone number associated with an ISDN line
3 coupled to the network device.
- 1 5. A method as recited in Claim 1, wherein the secondary signaling technology is ISDN,
2 and wherein the obtaining step comprises obtaining a telephone number associated with an
3 ISDN line coupled to the network device using a caller ID function.

1 6. A method as recited in Claim 1, wherein the network device is a residential
2 broadband router, wherein the primary signaling technology is asynchronous digital
3 subscriber line (ADSL), and wherein the secondary signaling technology is ISDN.

1 7. A method as recited in Claim 1, wherein the network device is a residential
2 broadband router, wherein the primary signaling technology is ADSL, wherein the secondary
3 signaling technology is ISDN, and wherein the unique link identifier is a telephone number
4 associated with an ISDN line.

1 8. A method as recited in Claim 7, wherein the step of registering the network device
2 with a service provider comprises using the ADSL line to connect to a Cisco Intelligent
3 Engine 2100 (IE2100) device associated with the service provider, and providing the unique
4 device identifier to the IE2100.

1 9. A method as recited in Claim 1, wherein the step of registering the network device
2 with a service provider comprises using the primary signaling technology to connect to a
3 configuration server associated with the service provider, and providing the unique device
4 identifier to the configuration server.

1 10. A method of authenticating a broadband customer premises network device that is
2 communicatively coupled to an ISDN line that supports ADSL over ISDN, the method
3 comprising the computer-implemented steps of:
4 obtaining, using the ISDN line, an ISDN telephone number uniquely associated with
5 the ISDN line;
6 establishing the ISDN telephone number as a unique identifier of the broadband
7 customer premises network device; and
8 authenticating the network device to a broadband network service provider by
9 providing the unique identifier to the service provider using ADSL
10 communication over the ISDN line.

- 1 11. A method as recited in Claim 10, further comprising the steps of receiving a
2 configuration from the service provider.
- 1 12. A method as recited in Claim 10, wherein the obtaining step comprises obtaining a
2 telephone number associated with the ISDN line using a caller ID function.
- 1 13. A method as recited in Claim 10, wherein the step of registering the network device
2 with the service provider comprises using ADSL over ISDN to connect to a Cisco Intelligent
3 Engine 2100 (IE2100) device associated with the service provider, and providing the unique
4 device identifier to the IE2100.
- 1 14. A method of deploying a network device, comprising the steps of:
2 receiving a customer premises equipment (CPE) device at a customer premises;
3 coupling a network link that supports a primary signaling technology and a secondary
4 signaling technology to the network device;
5 obtaining, using the secondary signaling technology, a unique link identifier
6 associated with the network link;
7 establishing the unique link identifier as a unique identifier of the CPE device;
8 connecting to a network service provider using the primary signaling technology;
9 authenticating the CPE device to a service provider by providing the unique device
10 identifier over the network link using the primary signaling technology; and
11 receiving, from the service provider, a configuration for the CPE device over the
12 network link.
- 1 15. A computer-readable medium carrying one or more sequences of instructions for
2 authenticating a network device, which instructions, when executed by one or more
3 processors, cause the one or more processors to carry out the steps of:
4 determining that a network link that uses a primary signaling technology and a
5 secondary signaling technology is coupled to the network device;

6 obtaining, using the secondary signaling technology, a unique link identifier that is
7 associated with the network link using the secondary signaling technology;
8 establishing the unique link identifier as a unique device identifier; and
9 authenticating the network device to a service provider by communicating the unique
10 device identifier to the service provider over the network link using the
11 primary signaling technology.

1 16. A computer-readable medium as recited in Claim 15, further comprising the steps of
2 receiving a configuration from the service provider.

1 17. A computer-readable medium as recited in Claim 15, wherein the secondary signaling
2 technology is ISDN.

1 18. A computer-readable medium as recited in Claim 15, wherein the secondary signaling
2 technology is ISDN, and wherein the unique link identifier associated with the secondary
3 telecommunication link is a telephone number associated with an ISDN line.

1 19. A computer-readable medium as recited in Claim 15, wherein the secondary signaling
2 technology is ISDN, and wherein the obtaining step comprises obtaining a telephone number
3 associated with an ISDN line using a caller ID function.

1 20. A computer-readable medium as recited in Claim 15, wherein the network device is a
2 residential broadband router, and wherein the primary signaling technology is ADSL.

1 21. A computer-readable medium as recited in Claim 15, wherein the network device is a
2 residential broadband router, wherein the primary signaling technology is ADSL, wherein the
3 secondary signaling technology is ISDN, and wherein the unique link identifier associated
4 with the secondary telecommunication link is a telephone number associated with an ISDN
5 line.

1 22. A computer-readable medium as recited in Claim 21, wherein the step of registering
2 the network device with a service provider comprises using ADSL to connect to a Cisco
3 Intelligent Engine 2100 (IE2100) device associated with the service provider, and providing
4 the unique device identifier to the IE2100.

1 23. A computer-readable medium as recited in Claim 15, wherein the step of registering
2 the network device with a service provider comprises using the primary signaling technology
3 to connect to a configuration server associated with the service provider, and providing the
4 unique device identifier to the configuration server.

1 24. An apparatus for configuring a network device, comprising:
2 means for determining that a network link that uses a primary signaling technology
3 and a secondary signaling technology is coupled to the network device;
4 means for obtaining, using the secondary signaling technology, a unique link
5 identifier that is associated with the network link using the secondary
6 signaling technology;
7 means for establishing the unique link identifier as a unique device identifier; and
8 means for authenticating the network device to a service provider by communicating
9 the unique device identifier to the service provider over the network link using
10 the primary signaling technology.

1 25. An apparatus as recited in Claim 24, further comprising:
2 means for receiving a configuration from the service provider over the primary
3 network link; and
4 means for initiating in-service operation.

1 26. An apparatus as recited in Claim 24, wherein the secondary signaling technology is
2 ISDN.

1 27. An apparatus as recited in Claim 24, wherein the secondary signaling technology is
2 ISDN, and wherein the unique link identifier associated with the secondary signaling
3 technology is a telephone number associated with an ISDN line.

1 28. An apparatus as recited in Claim 24, wherein the secondary signaling technology is
2 ISDN, and wherein the obtaining means comprises means for obtaining a telephone number
3 associated with the ISDN line using a caller ID function.

1 29. An apparatus as recited in Claim 24, wherein the network device is a residential
2 broadband router, and wherein the primary signaling technology is ADSL.

1 30. An apparatus as recited in Claim 24, wherein the network device is a residential
2 broadband router, wherein the primary signaling technology is ADSL, wherein the secondary
3 signaling technology is ISDN, and wherein the unique link identifier associated with the
4 secondary signaling technology is a telephone number associated with an ISDN line.

1 31. An apparatus as recited in Claim 30, wherein the step of registering the network
2 device with a service provider comprises using ADSL to connect to a Cisco Intelligent
3 Engine 2100 (IE2100) device associated with the service provider, and providing the unique
4 device identifier to the IE2100.

1 32. An apparatus as recited in Claim 24, wherein the registering means comprises means
2 for using the primary signaling technology to connect to a configuration server associated
3 with the service provider, and for providing the unique device identifier to the configuration
4 server.

1 33. An apparatus for configuring a network device, comprising:
2 a network interface that is coupled to the data network for receiving one or more packet
3 flows therefrom;

4 a processor;
5 one or more stored sequences of instructions which, when executed by the processor, cause
6 the processor to carry out the steps of:
7 determining that a network link that uses a primary signaling technology and a
8 secondary signaling technology is coupled to the network device;
9 obtaining, using the secondary signaling technology, a unique link identifier that is
10 associated with the network link using the secondary signaling technology;
11 establishing the unique link identifier as a unique device identifier; and
12 authenticating the network device to a service provider by communicating the unique
13 device identifier to the service provider over the network link using the
14 primary signaling technology.

1 34. An apparatus as recited in Claim 33, further comprising the steps of receiving a
2 configuration from the service provider.

1 35. An apparatus as recited in Claim 33, wherein the secondary signaling technology is
2 ISDN.

1 36. An apparatus as recited in Claim 33, wherein the secondary signaling technology is
2 ISDN, and wherein the unique link identifier associated with the secondary signaling
3 technology is a telephone number associated with an ISDN line.

1 37. An apparatus as recited in Claim 33, wherein the secondary signaling technology is
2 ISDN, and wherein the obtaining step comprises obtaining a telephone number associated
3 with an ISDN line using a caller ID function.

1 38. An apparatus as recited in Claim 33, wherein the network device is a residential
2 broadband router, and wherein the primary signaling technology is ADSL.

1 39. An apparatus as recited in Claim 33, wherein the network device is a residential
2 broadband router, wherein the primary signaling technology is ADSL, wherein the secondary
3 signaling technology is ISDN, and wherein the unique link identifier associated with the
4 secondary signaling technology is a telephone number associated with an ISDN line.

1 40. An apparatus as recited in Claim 7, wherein the step of registering the network device
2 with a service provider comprises using the ADSL line to connect to a Cisco Intelligent
3 Engine 2100 (IE2100) device associated with the service provider, and providing the unique
4 device identifier to the IE2100.

1 41. An apparatus as recited in Claim 33, wherein the step of registering the network
2 device with a service provider comprises using the primary signaling technology to connect
3 to a configuration server associated with the service provider, and providing the unique
4 device identifier to the configuration server.